Valve cover gaskets are the most common leak repair product. Fel-Pro® offer a full range of valve cover products to cover a variety of applications and repair needs.

PermaDryPlus® gaskets feature molded rubber over a rigid carrier. These premium gaskets are the right choice for applications in which traditional replacement gaskets have been known to fail or are difficult to install. Its reliable fit and construction make installation easy, and its performance is proven to be superior even on troublesome applications.

PermaDry® premium molded-rubber gaskets seal so well that their use means virtually no drip spots on the garage floor, making it the perfect replacement for OE molded rubber gaskets. The premium quality rubber compounds used ensure a consistent and long life seal across the entire valve cover. Valve cover grommets and spark plug tube seals are included where needed to complete the repair.

Fel-CoPrene® synthetic rubber doesn’t shrink or wick like cork. And it doesn’t compress either. Instead, it seals by deforming when clamped, all the while pushing back against the cover and casting as it tries to return to its original shape. This material provides a long-lasting, durable seal, lessens valve cover distortion, and is easily removed for quick clean-up.

Blue Stripe® cork-rubber combines the qualities of cork and rubber gaskets. It maintains its shape and flexibility, yet is highly compressible. It seals well because of its good compressibility and is easier to install than synthetic rubber gaskets because cork-rubber is somewhat rigid.
Combining Thinness with Strength

Oil pan gaskets are similar in many ways to valve cover gaskets. Like valve covers, oil pans are usually made of stamped steel, but with a stronger gasket flange. Because of the added weight and splash of crankcase oil, the oil pan has more assembly bolts, closely spaced and often with larger diameters than valve cover bolts. As a result, the clamping force on the oil pan gasket is much greater, so the gasket is usually thinner, but it still must be crush-resistant. Many current engines use heavier, cast oil pans to add supplemental strength to the vehicle frame. These engines require complex molded-rubber or rigid carrier design gaskets.

Oil pan gaskets seal the joint between the oil pan and the bottom of the engine block. Usually, the oil pan gasket also seals the bottom of the timing cover and the lower section of the rear main bearing cap or rear main seal retainer. The four corner joints between the side rail gaskets and the molded-rubber end loops of multiple-piece oil pan gasket designs require a small dab of RTV silicone sealant to ensure against leaks.

Oil pan gaskets, like valve cover gaskets, usually feature a rigid carrier design, molded-rubber, cork-rubber or synthetic rubber.

PermaDryPlus® gaskets’ one-piece construction makes installation easier than OEM style multi-piece assemblies or RTV sealing. Edge-molded silicone rubber on a rigid carrier provides superior fit, and high heat and vacuum resistance, while the included Oil Pan SnapUps® speed installation.

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Different Situations, Different Solutions.

Fel-Pro® PermaDryPlus® Gaskets

Late-model vehicles, particularly those with lightweight castings and bi-metal engines, can be problematic leakers. This is because typical paper gaskets cannot conform adequately to the warpage and corrosion of the housing flange. Coolant leaks can lead to low coolant levels, potentially resulting in engine overheating and catastrophic engine failure.

For these situations Fel-Pro® offers a molded rubber/rigid carrier Fel-Pro PermaDryPlus® water outlet gasket. PermaDryPlus water outlet gaskets feature rigid carrier construction and silicone sealing beads. The carrier prevents overtorquing and precise compression while the molded rubber assures a secure seal. These gaskets are the perfect solution for warped or corroded thermostat housing flanges.

Molded Rubber Seals

Increasingly, molded rubber seals are the design choice of OEMs. Molded rubber O-ring seals (featuring either a round or square cross section) fit into a groove or counter bore. Grooved seals are slotted to fit around the edge of the thermostat. Press-in-place (spaghetti style to fit in a groove) and edge-molded rubber (featuring a precise edge-sealing bead on a metal carrier) are other types of molded rubber seals.

When developing a molded rubber seal for an application, Fel-Pro engineers choose from a variety of rubber materials. Fel-Pro gaskets incorporate all four materials into their selection of water outlet gaskets. Each is highly effective for its intended applications.

EPDM & Nitrile – Excellent all-around performance.
HNBR – Offers enhanced coolant and chemical resistance.
Silicone – For increased temperature resistance.
FKM – For optimum chemical and temperature resistance.

Paper Gaskets

Typical Fel-Pro water outlet and thermostat gaskets are made of high-density paper material. This material is excellent for sealing most water outlet applications and is included in many Fel-Pro Head Sets and Head Installations Sets.

Fel-Pro Blue Stripe® paper is a high-density, high-quality paper material. (Its density balances good internal sealability, wick resistance, and conformability.) Choosing from over a dozen material variations (thickness and paper type), Fel-Pro engineers match materials to the needs of each specific application. The paper material can also feature Printoseal® sealing beads, for increased fluid sealability, and special coatings (silicone or PTFE) to reduce sticking and improve conformability to aftermarket conditions.

Water Outlet Gasket Assortment WO 20-08

The most popular Fel-Pro water outlet and thermostat housing gaskets are available in an assortment that includes all the top selling numbers for the current market. These gaskets are packaged individually for ease of inventory and sales.
Sets Combine Convenience with Technology

Fel-Pro® offers two types of gasket sets to solve the oil leaks associated with timing cover gaskets. Both sets include all the gaskets needed when removing and replacing the timing cover.

One type includes a crankshaft front repair sleeve (Sleeve ‘N’ Seal®) to seal a grooved hub or shaft. The other, for simple replacement of the seal and related gaskets, offers timing cover gaskets without the repair sleeve.

Timing cover gaskets are made of a variety of materials. For many older vehicles, Fel-Pro® Blue Stripe® paper material is very effective. Late-model vehicles, on the other hand, typically require molded-rubber or solid core gaskets with a thicker design to accommodate changes in timing cover castings. What’s more, today’s engines may have timing covers made of metal or plastic and may require the use of a Fel-Pro PermaDryPlus® timing cover gasket made with LEM (Liquid Elastomer Molded) technology.

New Fel-Pro PermaDryPlus timing cover gaskets, feature a highly sophisticated, patented technology that permits precise location, shape and height of multiple sealing beads on a rigid carrier. The exclusive LEM design permits significantly faster, easier gasket installation while eliminating potential sealing issues associated with the repair process in many applications.

Each PermaDryPlus timing cover gasket consists of a high-strength metallic carrier encapsulated in an extremely thin layer of silicone rubber. Sealing beads lock potential leak paths while providing the required “recovery” or spring between the mating surfaces.

No matter what material the engine used originally, Fel-Pro offers technicians the problem-solving timing cover gaskets they need for an efficient, reliable repair.
Crucial Seal Eliminates Driveability Problems

Leaks at the intake manifold are a common engine problem. A “vacuum leak” allows too much air to enter the engine. This can lead to driveability problems such as rough idling and stumbling on acceleration. Vacuum leaks at the intake manifold can also cause:

• Hot-running engine
• Detonation
• Decreased valve life
• Increased oxides of nitrogen (NOX) emissions

An intake manifold coolant leak is also a possibility in today’s engines. Where applicable, Fel-Pro® offers a premium PermaDryPlus® problem-solving gasket for applications that have proved specifically problematic in the aftermarket repair environment.

Upper Intake Manifold Sets

Typically, upper and lower manifold gaskets are included in Fel-Pro intake manifold sets. For certain fuel-injection applications, however, upper intake manifold sets are offered. These sets include intake manifold-to-plenum gaskets, as well as other required plenum gaskets. Technicians would use an upper manifold set when working on the fuel-injection system or on some valve cover repairs where it is necessary to remove parts of the fuel-injection system.

Valley Pan Gaskets

Some V-type engines use a wide steel intake manifold gasket called a valley pan (also referred to as a dishpan, turkey pan or turtleback). It is designed to prevent oil from caking on the hot underside of the intake manifold. Because these valley pan gaskets are so large, they are not included in Fel-Pro Head (HS) and Full (FS) Sets. (They are packaged in a separate box to prevent bending or other damage.) The catalog entry and the label on the set box both indicate that the valley pan gasket must be supplied separately.

PermaTorque® – Type Construction

Many Fel-Pro® intake manifold designs feature rubber/fiber facing over a steel core for leak-free sealing and easy removal when necessary.

PermaDryPlus®

Problem-solving Fel-Pro PermaDryPlus gaskets feature advanced technologies designed to address sealing problems unique to the aftermarket repair environment. Their construction includes sophisticated molded-rubber designs, rigid carriers and sealing advances to help the technician complete the repair faster and more easily with a permanent seal.
Many new engines are assembled without exhaust manifold gaskets. Since the castings are new and machined surfaces are smooth, the manifold can fit tightly against the head without leaks. After prolonged use with high exhaust temperatures and numerous heating/cooling cycles, the manifold sealing surfaces may warp and corrode. Even just removing the manifold may slightly warp it. So when servicing the manifold, there is a good chance that an exhaust manifold gasket will be required to provide an effective seal.

Because of the expansion and contraction from the heating/cooling cycles, many exhaust manifold gaskets are constructed with a fiber facing material on one side and perforated steel on the other.

When this is the case, the steel face of the gasket is installed toward the manifold, with the fiber surface against the head. This allows expansion and contraction of the exhaust manifold to take place without damaging the fiber side of the gasket.

This design seals the exhaust manifold while allowing it to move on the metal surface of the gasket, just like it does on the metal surface of the head in the absence of a gasket.

Federal-Mogul engineers design Fel-Pro® gaskets with easy installation in mind. For example, on many exhaust manifold gaskets, the engineers provide two “hook-style” bolt holes per gasket rather than traditional bolt holes. This allows technicians to position the exhaust manifold using the two bolts at the hook-style holes, and then simply slip the gasket into place between the head and exhaust manifold which have been pre-assembled. It’s a feature that can save the installer up to 20 minutes in a V-type engine.

Fel-Pro Head Sets (HS) and Head Installation Sets (HIS) always include exhaust manifold gaskets.
Rear main bearing seals keep oil from leaking at the rear of the crankshaft. In the case of a vehicle with a manual transmission, a faulty or worn seal can allow oil to leak onto the clutch, causing slipping and chattering.

Viton® combines the abrasion resistance of polyacrylate and the heat resistance (450° F) of silicone – at a premium price. It is required on many high-temperature engines.

PTFE rubber is the ultimate in rear main seal design and material. It offers the best in fluid and high-temperature compatibility, and the unique “laydown lip” contact sealing surface can run on undersize shafts, seal minor shaft imperfections and virtually eliminate shaft wear.

**Types of Seals**

Rear main bearing seals are made of either rope or synthetic rubber materials. The rope or wick style seal is typically found on older engines. This type of seal, which can be tricky to install, is no longer designed into most new engines. In fact, in certain older applications, synthetic rubber seals have replaced the rope material. However, due to the strict tolerances involved, a rubber seal can ONLY be substituted reliably when indicated by the Fel-Pro® catalog.

Molded synthetic rubber is the material most commonly used for rear main seals. It offers proven sealing ability, excellent heat resistance and easy installation.

**Material Choices**

Nitrile rubber is used on many older engine applications where heat resistance (up to 250° F) is not a problem. Most synthetic rubber, two-piece rear main bearing seals are made of polyacrylate. It offers good heat resistance (350° F) and tough abrasion resistance at a reasonable cost.

Silicone is often used in higher temperature (480° F) engine applications. The drawback of silicone is that it is fragile and requires careful handling during installation.

Fel-Pro® Sets commonly feature premium National® Oil Seals, manufactured by Federal-Mogul, a global leader in crankshaft seal manufacturing.

**Seal Designs**

Some seals are designed with ribs around the lip. These ribs, or helixes, help direct the oil back into the engine for proper oil control. Other seals have a double lip design. The inner lip has a helix that helps direct oil back into the engine, while the outer lip keeps dust and dirt from contaminating the inner sealing lip. This improves the long-term performance of the seal.

An optional design available for Chevrolet engines has an offset sealing lip. This can be used when the point of contact of the previous seal has worn a groove into the crankshaft sealing surface. The offset lip contacts the shaft at a different point than the original equipment seal, preventing oil leaking through the groove and eliminating the need for expensive crankshaft repair or replacement.

For certain applications, Fel-Pro offers a choice of single lip, offset lip or double lip design as shown here.